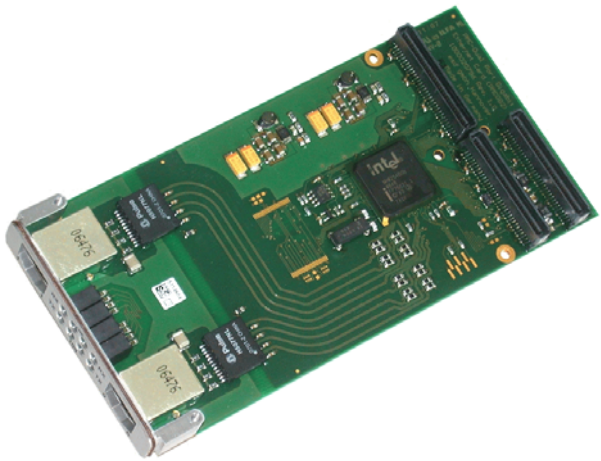
PMC-ETH2/GB-RJ45

1000BASE-T Ethernet PMC Module



Hardware Manual

to Product V.2088.xx

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Changes in the chapters

The changes in the document listed below affect changes in the hardware as well as changes in the description of the facts, only.

Chapter	Changes as compared with previous version
-	First issue
-	-

Technical details are subject to change without further notice.

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1. Overview

1.1 Description of the PMC-ETH2/GB-RJ45 Adapter

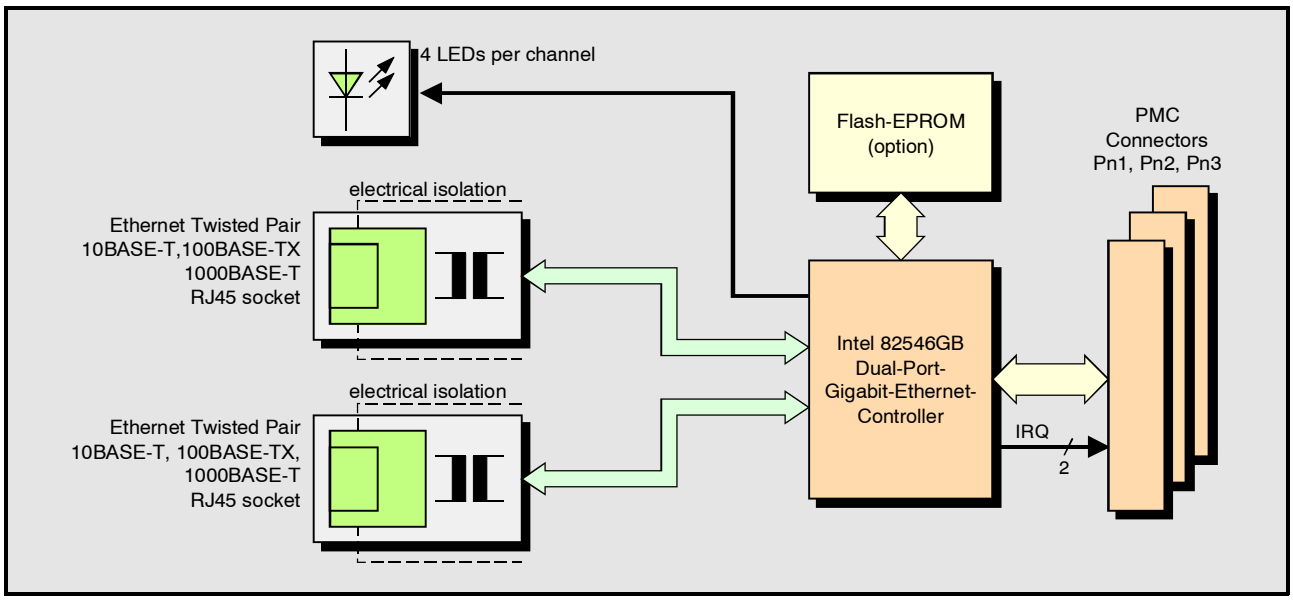


Fig. 1: Block circuit diagram of the PMC-ETH2/GB-RJ45 module

The PMC-ETH2/GB-RJ45 is a PMC-Target board in 'Single' PCI-Mezzanine-Card format.
The Intel 82546GB Dual Gigabit Controller provides two standard IEEE802.3 Ethernet interfaces in a single component.
Both independent Gigabit Ethernet interfaces are designed for 10/100/1000 Mbps performance. The full duplex mode is supported for all bit rates.

The PMC-ETH2/GB-RJ45 module works with standard Ethernet drivers.

The Ethernet interfaces are connected via RJ45-sockets in the front panel. The interface is electrically isolated from the Ethernet controller.

LEDs in the front panel indicate the status of the Ethernet interfaces.

1.2 PCB View and Position of the Connectors

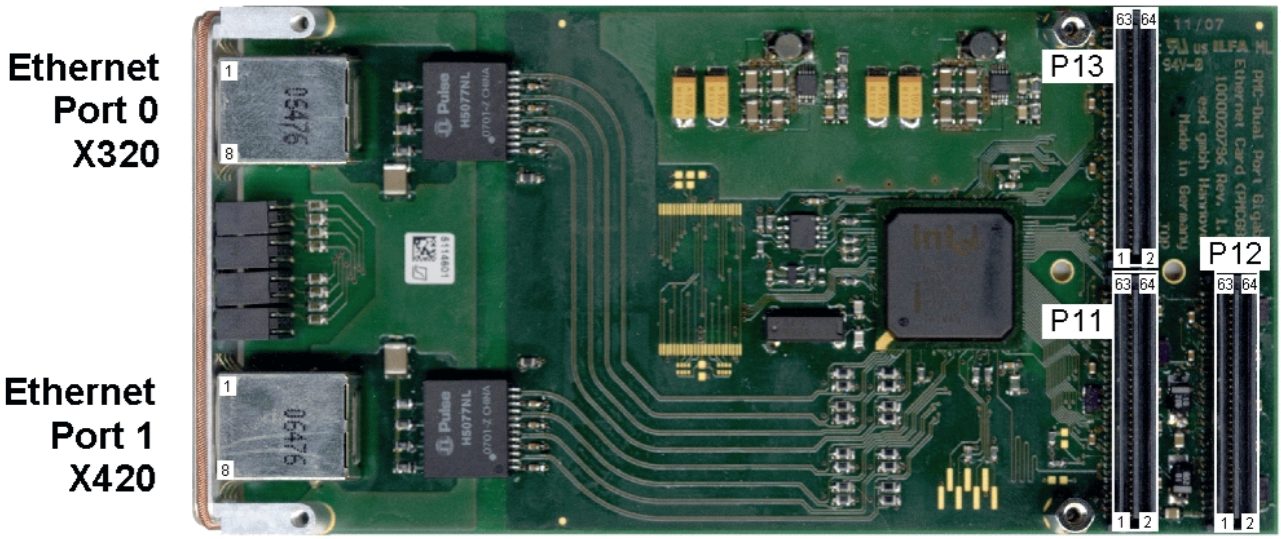
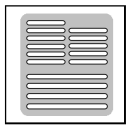


Fig. 2: PCB view with position of the connectors (PCB side turned to the carrier board)



2. Technical Data

2.1 General Technical Data

Ambient temperature	0...55 °C (bit rate = 1 Gbit/s without convection) 0...60 °C (bit rate = 1 Gbit/s with convection; air stream ≥ 0.2 m/s; bit rate 10/100 Mbit/s also without convection)
Humidity	maximum 90 %, non-condensing
Power supply	via PMC bus, required voltages: 3.3 V / ca. 1.15 A (max.)
Connectors	P11 (64-pin PMC connector) - PCI signals (Pn1/Jn1) P12 (64-pin PMC connector) - PCI signals (Pn2/Jn2) P13 (64-pin PMC connector) - PCI signals (Pn3/Jn3) X320 (8-pin RJ45 socket) - Ethernet Twisted Pair 10/100/1000 Mbit/s (Port 0) X420 (8-pin RJ45 socket) - Ethernet Twisted Pair 10/100/1000 Mbit/s (Port 1)
Dimensions	'Single' PCI-Mezzanine Card format 74 mm x 152 mm, length including front panel
Weight	77 g

2.2 PMC Interface

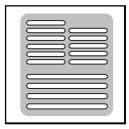
Standards	Ethernet controller: accordant with PCI Local Bus Specification 2.3 PMC: IEEE Std. P1386.1-2001
Interrupts	Ethernet Port 0: IRQ A, Port 1: IRQ B
Clock rate, Signalling voltage	33 MHz with 3.3 V or 5 V signalling voltage or 66 MHz with 3.3 V signalling voltage
Power supply voltage	3.3 V via PCI-Bus
Connectors	P11, P12, P13 according to IEEE Std. P1386.1-2001

2.3 Ethernet Interface

Number	2 ports
Ethernet controller	82546GB, Dual Port Gigabit Ethernet Controller
Bit rate	10/100/1000 Mbit/s, both interfaces full-duplex, automatic bit rate detection
Physical interface	Twisted Pair (IEEE802.3) 10BASE-T, 100BASE-TX, 1000BASE-T
Electrical isolation	via repeating coil
Connector	2 x 8 pin RJ45-socket in the front panel

2.4 Software Support

The PMC-ETH2/GB-RJ45 module runs with standard system drivers of Windows NT/2000, Linux, VxWorks and QNX for Ethernet interfaces. Further information on software installation can be taken from the corresponding manuals.



2.5 Order Information

Type	Description	Order No.
PMC-ETH2/GB-RJ45	PMC module with 2x 10/100/1000 Mbit/s Ethernet, front panel with 2x RJ45	V.2088.01
PMC-ETH2/GB-RJ45-MD	User manual in English [1*)]	V.2088.20
PMC-ETH2/GB-RJ45-ENG	Engineering manual in English [2*)] Content: Block circuit diagram, PCB top overlay drawing, data sheets of significant components	V.2088.25

1*) If module and manual are ordered together, the manual is free of charge.
2*) This manual is liable to charges, please contact our support.

3. Hardware Installation

3.1 Installation

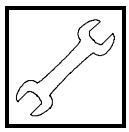
Caution!
Mortal danger, never carry out work while power supply voltage is switched on!

Attention !
Electrostatic discharges may cause damage to electronic components. To avoid this, please perform the following steps *before* you touch the module, in order to discharge the static electricity from your body:

- Switch off the power of your computer, but leave it connected to the mains.
- Please touch the metal case of the computer now to discharge yourself.
- Furthermore, you should prevent your clothes from touching the computer, because your clothes might be electrostatically charged as well.

Procedure:

1. Switch off your computer and all connected peripheral devices (monitor, printer, etc.).
2. Discharge your body as described above.
3. Disconnect the computer from the mains.
   If the computer does not have a flexible mains cable, but is directly connected to mains, disconnect the power supply via the safety fuse and make sure that the fuse cannot switch on again unintentionally (caution label).
4. Open the case.
5. Remove the carrier board (if already installed) and plug the PMC-ETH2/GB-RJ45 module carefully on the carrier board. Pay attention that the PMC module is correctly installed on the carrier board.
   Fix the module with the screws on the carrier board. Use the four M 2.5 x 6 mm screws which are contained in the product package of the module.
6. Install the carrier board in your system.
7. Close the computer case again.



8. Connect the Ethernet.
   The first Ethernet interface is connected via the RJ45-socket X320 and the second Ethernet interface is connected via the RJ45 socket X420.

9. Connect the computer to mains again (mains connector or safety fuse).

10. Switch on the computer and the peripheral devices.

11. End of hardware installation.

12. Set the Ethernet interface properties in your operating system. Refer to the documentation of the operating system.

3.2 Control

3.2.1 ID Codes

The table below shows the ID codes of the PMC-ETH2/GB2-RJ45 module:

Vendor ID	8086_h
Device ID	1079_h
Subsystem ID	$000D_h$
SubSystemVendor ID	$12FE_h$

Table 2: ID codes

3.2.2 MAC-ID

The MAC-IDs of the Ethernet ports 0 and 1 can be taken from the label on the bottom layer of the PMC-ETH2/GB2-RJ45 module.

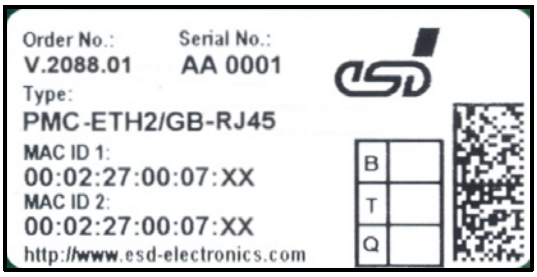


Fig. 3: Label on PMC-ETH2/GB2-RJ45

Order No.: **esd**-order number (V.2088.01)

Serial No.: Serial number from AA xxxx

Type: Name of the product

MAC ID 1: MAC ID of Ethernet interface Port 0

MAC ID 2: MAC ID of Ethernet interface Port 1

4. Front Panel View and LED Display

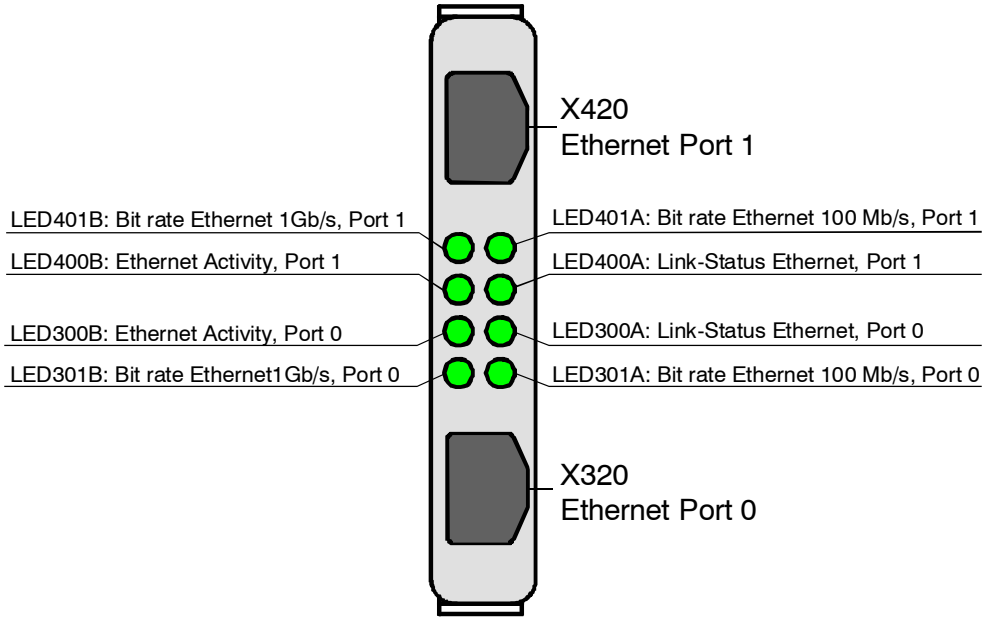


Fig. 4: LED- and connector position

Port	Name	LED	Colour	Display function of the LEDs (LED on)
1	tbd.	LED401B	green	Speed 1000 Status Ethernet Port 1, interface works with a bit rate of **1 Gbit/s** (at 10/100 Mbit/s LED off).
	tbd.	LED401A	green	Speed 100 Status Ethernet Port 1, interface works with a bit rate of **100 Mbit/s** (at 10/1000 Mbit/s LED off).
	tbd.	LED400B	green	**Act**ivity, Access to Ethernet Port 1 on the Dual Gigabit Ethernet-Controller 82546GB
	tbd.	LED400A	green	**Link** Status-Ethernet Port 1 (Link to Server or Hub detected)
0	tbd.	LED300B	green	**Act**ivity, Access to Ethernet Port 0 on the Dual Gigabit Ethernet-Controller 82546GB
	tbd.	LED300A	green	**Link** Status-Ethernet Port 0 (Link to Server or Hub detected)
	tbd.	LED301B	green	Speed 1000 Status Ethernet Port 0, interface works with a bit rate of **1 Gbit/s** (at 10/100 Mbit/s LED off).
	tbd.	LED301A	green	Speed 100 Status Ethernet Port 0, Interface works with a bit rate of **100 Mbit/s** (at 10/1000 Mbit/s LED off).

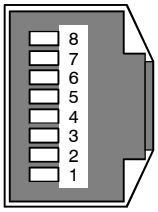
Table 2: Display function of the LEDs

5. Connector Assignment

5.1 Ethernet Connectors (X320, X420)

Connector type (device): RJ45-socket

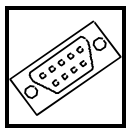
Pin Position:



Pin Assignment:

Pin	**Port 1** X420 **Signal**	**Port 0** X320 **Signal**
8	TP082 (CT0-)	TP081 (CT0-)
7	TP072 (CT0+)	TP071 (CT0+)
6	TP062 (RxD-)	TP061 (RxD-)
5	TP052 (CT1-)	TP051 (CT1-)
4	TP042 (CT1+)	TP041 (CT1+)
3	TP032 (RxD+)	TP031 (RxD+)
2	TP022 (TxD-)	TP021 (TxD-)
1	TP012 (TxD+)	TP011 (TxD+)

8-pin RJ45-socket



5.2 Assignment of the 64-pin PMC-Connector P11

Signal	Pin	Pin	Signal
n.c.	1	2	-12V
GND	3	4	INTA#
INTB#	5	6	n.c.
BMODE1#	7	8	+5V
n.c.	9	10	n.c.
GND	11	12	+ 3.3VAUX
PCI-CLK	13	14	GND
GND	15	16	GNT#
REQ#	17	18	+5V
V (I/O)	19	20	AD31
AD28	21	22	AD27
AD25	23	24	GND
GND	25	26	C/BE3#
AD22	27	28	AD21
AD19	29	30	+5V
V (I/O)	31	32	AD17
FRAME#	33	34	GND
GND	35	36	IRDY#
DEVSEL#	37	38	+5V
GND	39	40	LOCK#
n.c.	41	42	n.c.
PAR	43	44	GND
V (I/O)	45	46	AD15
AD12	47	48	AD11
AD09	49	50	+5V
GND	51	52	C/BE0#
AD06	53	54	AD05
AD04	55	56	GND
V (I/O)	57	58	AD03
AD02	59	60	AD01
AD00	61	62	+5V
GND	63	64	REQ64#

Connector Type accordant with PMC SPECIFICATION IEEE1386.1-2001

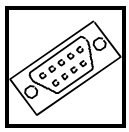
n.c. ... not connected

5.3 Assignment of the 64-pin PMC-Connector P12

Signal	Pin	Pin	Signal
+12 V	1	2	n.c.
n.c.	3	4	TDO
TDI	5	6	GND
GND	7	8	n.c.
n.c.	9	10	n.c.
n.c.	11	12	+3.3V
RST#	13	14	n.c.
+3.3V	15	16	n.c.
PME#	17	18	GND
AD30	19	20	AD29
GND	21	22	AD26
AD24	23	24	+3.3V
IDSEL	25	26	AD23
+3.3V	27	28	AD20
AD18	29	30	GND
AD16	31	32	C/BE2#
GND	33	34	n.c.
TRDY#	35	36	+3.3V
GND	37	38	STOP#
PERR#	39	40	GND
+3.3V	41	42	SERR#
C/BE1#	43	44	GND
AD14	45	46	AD13
M66EN	47	48	AD10
AD08	49	50	+3.3V
AD07	51	52	n.c.
+3.3V	53	54	n.c.
n.c.	55	56	GND
n.c.	57	58	n.c.
GND	59	60	n.c.
ACK64#	61	62	+3.3V
GND	63	64	n.c.

Connector Type accordant with PMC SPECIFICATION IEEE1386.1-2001

n.c. ... not connected



5.4 Assignment of the 64-pin PMC-Connector P13

Signal	Pin	Pin	Signal
n.c.	1	2	GND
GND	3	4	C/BE7#
C/BE6#	5	6	C/BE5#
C/BE4#	7	8	GND
V(I/O)	9	10	PAR64
AD63	11	12	AD62
AD61	13	14	GND
GND	15	16	AD60
AD59	17	18	AD58
AD57	19	20	GND
V(I/O)	21	22	AD56
AD55	23	24	AD54
AD53	25	26	GND
GND	27	28	AD52
AD51	29	30	AD50
AD49	31	32	GND
GND	33	34	AD48
AD47	35	36	AD46
AD45	37	38	GND
V(I/O)	39	40	AD44
AD43	41	42	AD42
AD41	43	44	GND
GND	45	46	AD40
AD39	47	48	AD38
AD37	49	50	GND
GND	51	52	AD36
AD35	53	54	AD34
AD33	55	56	GND
V(I/O)	57	58	AD32
n.c.	59	60	n.c.
n.c.	61	62	GND
GND	63	64	n.c.

Connector Type accordant with PMC SPECIFICATION IEEE1386.1-2001

n.c. ... not connected